

Technical Page

Proposal Type: Regular
 General Category: Astronomy
 Sub-Category: Spectroscopy
 Observation Category: Extragalactic
 Total Time Requested: 30 Hours

Proposal Title: A Search for 6.7 GHz Methanol Masers in M33

ABSTRACT:

We propose to carry out a search for analogs of Galactic methanol masers in M33. 6.6 GHz methanol masers are among the best tracers of the early stages of high-mass star formation in the Milky Way, and are the second brightest maser sources known. Yet no extragalactic methanol masers beyond the LMC/SMC have been discovered. If methanol masers in M33 follow the same distribution as exhibited by bright methanol masers in the Milky Way, we expect a substantial population to exist at flux densities ≤ 10 mJy. The 6 K/Jy sensitivity of Arecibo with the highly sensitive 6 to 8 GHz cooled receiver ($T_{sys} < 30$ K), will allow us to achieve a 5σ sensitivity of 5 mJy in 1 hr integration time with 0.5 km s^{-1} velocity resolution. We propose to observe 25 of the giant molecular clouds in the central portion of M33 catalogued by Engargiola et al. (2003). Observing a significant fraction (about 40%) of the GMCs in the central portion of M33 should give us a reasonable probability of detecting several masers and could be the first step towards using these masers to trace high-mass star formation and studying the relationship between methanol masers and GMC mass in this SA galaxy.

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Service Observing Request

- None
- All of the observing run.
- Part of the observing run.
- Queue Observing

Remote Observing Request

- No
- Maybe
- Yes

Instrument Setup

Atmospheric Observation Instruments:

Special Equipment or setup: none

RFI Considerations

Frequency Ranges Planned

see proposal